

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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In re Patent Application of:

Toshiki, ORIGUCHI et al.

Application No.: 10/581,446

Confirmation No.: 2164

Filed: July 11, 2006

Art Unit: 1767

For: VINYL-URETHANE COPOLYMERS WITH  
INTERMEDIARY LINKAGE SEGMENTS  
HAVING SILICON-OXYGEN BONDS AND  
PRODUCTION METHODS THEREOF

Examiner: M. A. Salvitti

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**DECLARATION UNDER 37 CFR 1.132**

MS Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

I, Toshiki Origuchi, a Japanese citizen, 183-4-603 Onoshiba-cho, Naka-ku, Sakai-shi, Osaka 599-8233, JAPAN declare as follows:

I completed a Master's course in department of technology, Osaka Prefecture University in March, 1983,

I joined KONISHI CO., LTD in April, 1983 and had been engaged in research and development of domestic adhesives,

I am named as a co-inventor in U.S. Application No. 10/581,446, published as US-2007-0117902-A1 on May 24, 2007,

I am familiar with the invention of the above-identified application;

I have read and understand the Official Action mailed on October 29, 2010 against the above-identified application and the prior art references cited therein; and

In order to evidence that the invention of the above-identified application is distinguished from the prior art, I explain the essence of the two prior art references, to the best of my knowledge.

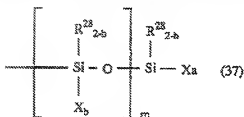
Mori: JP2003-238795

[Constitution of the invention]

A feature of the invention of Mori is a curable resin composition comprising silylated urethane resin (A), vinyl polymer (B) and modified silicone resin (C), wherein the vinyl polymer (B) has one or more reactive silyl group (i) and one or more nitrogen atom or one or more sulfur atom (ii) in the molecule (claim 2).

Another feature of the invention is a method for producing curable resin composition comprising polymerizing vinyl polymer (B) in the presence of silylated urethane resin (A) and/or modified silicone resin (C) (claims 3-6).

The reactive silicon group in the modified silicone resin (C) is defined as shown in [chemical formula 37] of paragraph [0060]. This formula is as follows:



Paragraph [0069] reads as follows: "organotin compounds, metal complexes, basic compounds, the organic phosphorous compound and water (moisture in air) can be used as the above-mentioned catalyst".

Although there is no clear statement, the curing mechanism of the "curable resin composition" is the one by "de-alkoxy condensation reaction of the hydrolyzable silyl group by moisture".

[Effects]

Mori defines the effects of his invention as follows:

- Excellent peel strength and adhesion strength from and to various adherents;
- Excellent expansion of the cured articles;
- Excellent bond strength after predetermined duration (open time) after application; and
- Low viscosity

Nomura: JP2004-035590

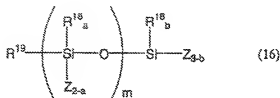
[Constitution of the invention]

A feature of the invention of Nomura is a contacting type silicone resin adhesive containing silylated urethane resin (A) and moisture curable resin (B) at a defined ratio, wherein the moisture curable resin (B) consists of a (meth)acrylate alkylester polymer having intramolecular reactive silicon groups (i) and oxyalkylene polymer having intramolecular reactive silicon groups (ii) (claim 1).

When obtaining the above-mentioned acrylic polymer having reactive silicon

groups (i), paragraph [0038] explains that "the reaction may also be performed in the presence of an oxyalkylene polymer having reactive silicon groups (ii) that can be crosslinked".

As a method of introducing the reactive silicon groups into the above-mentioned acrylic polymer having reactive silicon groups (i), paragraph [0040] explains that a compound shown by general formula (16) below, i.e., "compound having the above-mentioned polymeric unsaturated bonds and the reactive silicon groups" may be used.



In the formula, R<sup>1a</sup> is "organic residue having one or more polymeric unsaturated bond(s)" and m is an integer of 0-18. The compound is indicative of a so-called acrylic silane compounds and the vinyl silane compounds.

Similar to that of Mori, paragraph [0059] of Nomura describes that "the organotin compounds, the metal complexes, the basic compounds, the organic phosphorous compounds, and water (moisture in air) can be used as the above-mentioned curing catalyst that can optionally be contained".

The technology disclosed by the whole specification is "Contacting-type moisture-curable resin adhesive."

#### [Effects]

Nomura defines the effects of his invention as follows:

- > Short tuck expression time
- > High bonding strength immediately after tuck expression
- > Long tuck range
- > Long adhesion
- > Excellent adhesion to wide variety of nonporous materials such as metals, plastics, and rubbers

With respect to the teaching of Mori and Nomura, by mixing and making complex acryl resins to moisture curable resins (silylation urethane resins and transformation silicone resins), both of these technologies aim to provide:

- (1) sticking adhesive property (contacting adhesive property) by internal plasticization;
- (2) improvement of adhesive property of various adhesives; and
- (3) low viscosity.

When a polymer consisting only of the acrylic monomers is used, the acryl resins often bleed out (seep) after their curing. Therefore, the acrylic monomers

having the reactive silicon groups (hydrolyzable silyl groups) are used to copolymerize with the acryl resin. It is notable that resulting curable resin or adhesive is the moisture curing type (reactive and curable with moisture in air), and non-aqueous.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Toshiki Origuchi

Toshiki ORIGUCHI

Feb. 10, 2011

Date